CULVERT AVOIDANCE AND MINIMIZATION DESIGN GUIDANCE

When designing a culvert, the engineer should ensure that the following avoidance and minimization design criteria have been evaluated and implemented as much as practicable.

- Proposed culvert slope is consistent with the existing stream slope.

- Proposed low flow dimensions through the culvert are consistent with the existing low flow channel dimensions in the stream. Alternating low flow sills/baffles may be required to achieve this.

- Proposed low flow velocities through the culvert are consistent with the existing low flow velocities in the stream.

- Proposed culvert is appropriately buried such that the bed material will be retained throughout the culvert length. The use of alternating low flow sills/baffles should be evaluated based on culvert slope, bed material and stream stability.

- The dimension and profile of the stream above and below the culvert should not be modified by widening the stream channel or by reducing the depth of the stream in the vicinity of the culvert. Establishment of a low flow floodplain bench should be evaluated at the inlet and outlet of multiple barrel culverts.

- Culvert length has been minimized as much as possible.

- Culvert alignment avoids sharp bends at the inlet and outlet as much as practicable to avoid bank erosion at the inlet and outlet. Stream realignment and/or armoring may be warranted to improve culvert alignment and/or to mitigate potential stream bank erosion. The amount of stream work to be done up and down stream should be minimized as much as possible.